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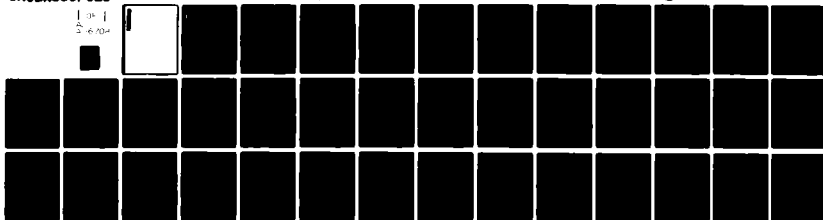   SYSTEMS MANAGEMENT FOR FORCE MODERNIZATION EQUIPMENT.(U)
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Systems Management for Force Modernization Equipment		5. TYPE OF REPORT & PERIOD COVERED Student Essay
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) LTC Donald L. Hudson		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army War College Carlisle Barracks, PA 17013		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Same		12. REPORT DATE 15 April 1982
		13. NUMBER OF PAGES 29
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Purpose of the paper is to induce ideas in developing an analytical tool that will assist commanders and staff at the division level to more efficiently implement the army's modernization program. It will also serve as a system for methodically planning and coordinating the myriad tasks that are required for all levels of command from the Battalion through Forces Command (FORSCOM).

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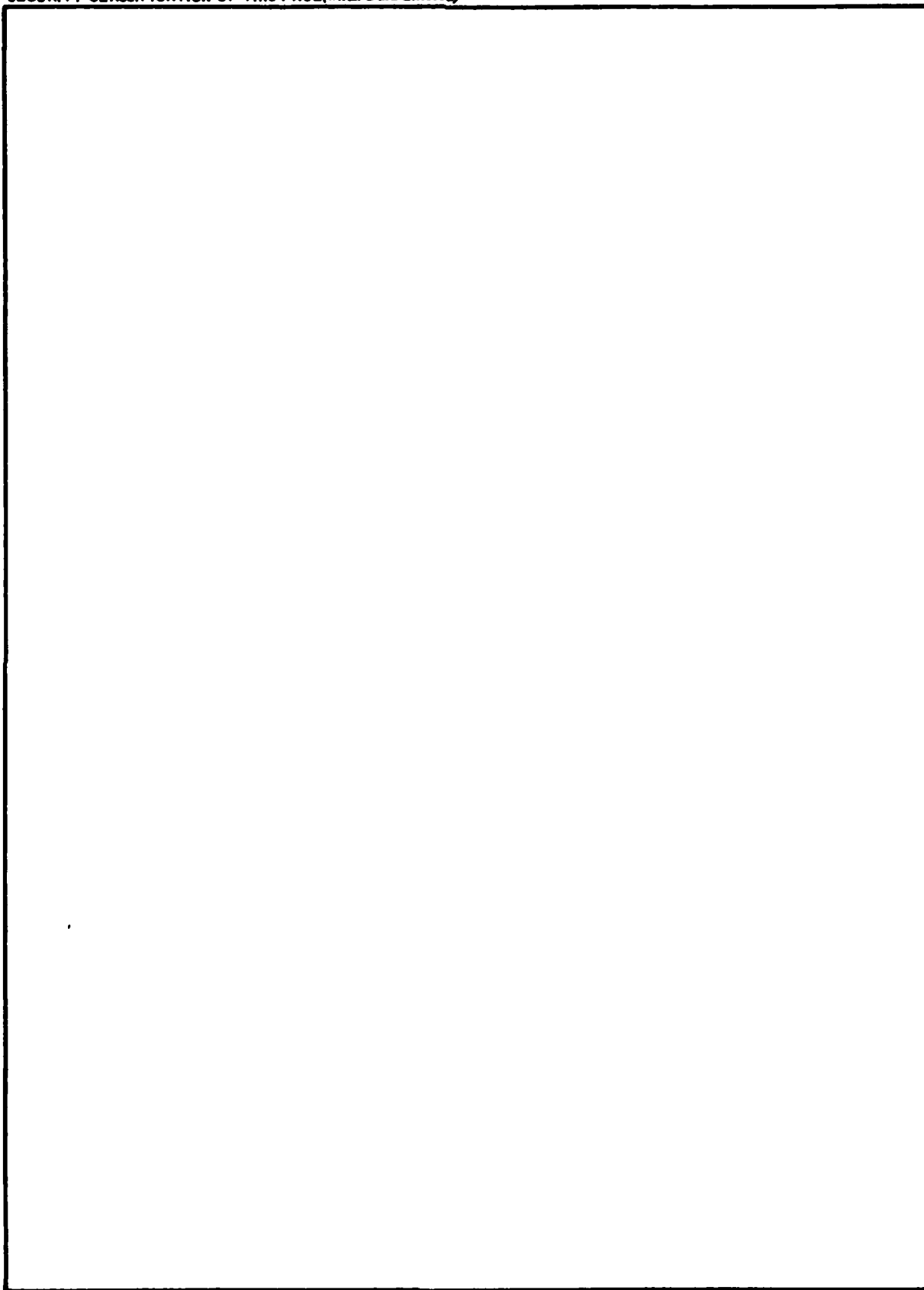
US ARMY WAR COLLEGE

INDIVIDUAL RESEARCH BASED ESSAY

SYSTEMS MANAGEMENT FOR FORCE MODERNIZATION EQUIPMENT

BY

LTC DONALD L. HUDSON

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CHAPTER I

INTRODUCTION

Background

> During the siege of Rhodes in 304 B.C., Demetrius had
> constructed an enormous rock-throwing machine moved by 3,400
> men; the enemy destroyed the engine by making it fall into a
> hole.[1]

From this simplistic form of warfare, mankind has slowly passed
from the emotional experience of conquering his foe with simple, cheap,
and crude weapons while standing eyeball-to-eyeball with the glitter of
cold steel. Today the shift has been to the impersonal destruction of
the enemy by long-range indirect and direct fire weapons of mass
destruction.

For over two thousand years, the war-making technology transition
has been one of exponential growth and appears to be unending as we
approach the realization of the Buck Rogers era of the twenty-first
century. To insure that the United States of America enters the next
century as a superpower and as a sovereign nation with the strength to
preserve peace or win any war against any potential enemy, it must not
only keep pace with technology but also expertly field the output of
technology and capitalize on the maximum capabilities of the products.

Over the past decade, the United States Army has allocated approxi-
mately two billion dollars a year on resource and development. As a

result of minimal spending for the future and inadequate funding for procurement, it appears that presently the Army is inferior in equipment when compared to our potential enemies.[2] This point was vividly projected to Congress by the Army's senior leadership in February 1979:

> At this point, the US Army is . . . from an equipment point of view . . . second rate. . . . But we have within a period of three to four years, the opportunity to transform (the Army) into one that is competitive with the Armies of our potential enemies.[3]

General E. C. Meyer, the United States Army Chief of Staff, addressed a white paper to the soldiers and civilians of the United States Army in which he explained his views on the Army of the 80's. On the subject of modernization he stated that, "next to manning the force, the management of modernization is the most complex challenge facing the Army in the 1980's.[4] He further added credence to this subject when he stated in an address to the First Session of the 97th Congress, "We must seek a sensible balance between readiness today and modernization of our forces for tomorrow.[5]

The Army's research and development program of the 70's was designed specifically to trade off time for superior and quality equipment for the future. The orderly process of a time schedule was upset with the Soviet invasion of Afghanistan that further emphasized the Soviet's shift in the strategic balance of its nuclear and conventional advantages in Europe and the threat to the Persian Gulf oil fields.[6] To counter this threat, the real growth of the defense budget has been increased for each consecutive year since 1981.[7] Throughout this period, the Total Obligational Authority (TOA) for the Army's share of the budget has been oriented toward modernization of the force, especially in the area of procurement. It appears that the decision to

spend on research and development versus procurement paid off as evidenced in the changing ratio of research to procurement dollars. For example, in 1977 the Army spent $1 billion on major systems of which two-thirds went for research and development compared to 1981's expenditure of $3.7 billion of which $3 billion went for procurement.[8] The Army's budget request for fiscal year 1983 further reflects a much greater increase for the area of procurement, and research and development; $17.4 billion and $4.5 billion respectively.[9] Adequate funding is now available for modernization of the Army; however, the challenge will be to accomplish modernization without a reduction in readiness by meeting the changes in tactics, doctrine, training, and support concepts.[10] The materiel fielding plans have been developed, the project managers have basically done their jobs, now it is up to the units in the field to properly absorb the fifty major systems and several hundred smaller systems that are scheduled for fielding in the next five years.[11]

Purpose

The primary purpose of this paper is to induce ideas in developing an analytical tool that will assist commanders and staffs at the division level to more efficiently implement the Army's modernization program. It will also serve as a system for methodically planning and coordinating the myriad tasks that are required for all levels of command from the Battalion through Forces Command (FORSCOM).

Methodology

This paper is based on research of unclassified sources at the United States Army War College, and experience gained as an Infantry

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Battalion commander and executive officer for a Division Support Command (DISCOM). Non-military sources consist of experience gained and related textbooks and papers in the Public Administration Master's program at Shippensburg State College, Shippensburg, Pennsylvania.

Chapters II and III establish the conditions, criterion, and techniques for developing a system that will enhance coordination and efficient implementation of the modernization program commensurate with maintaining a high degree of unit readiness. Chapter II specifically deals with the techniques for developing a network analysis approach to the unit equipment fielding plans. The Program Evaluation and Review and Technique (PERT) will be used for this purpose. A step-by-step approach will be followed to explain the generation of a network, evaluation of the program, techniques for monitoring its programs, and how and why the system may be modified. Chapter III will further expand on the subject through a sample model exercise. It will cover recommended techniques in developing a network analysis for the construction of a network plan, a work breakdown structure and the design of a PERT network for a Division.

ENDNOTES

1. Martin Blumenson, <u>The Patton Papers 1885-1940</u>, II (Boston: Houghton Mifflin Company, 1972), pp. 932-33.

2. James B. Lincoln, "Fielding Army Systems: Experiences and Lessons Learned," <u>Concepts</u>, Vol. 3, No. 4, Autumn 1980, p. 20.

3. Lieutenant General Donald Keith, The Honorable Percy Pierre, Joint Statement before House Armed Services Committee, 23 February 1979.

4. Letter from General E. C. Meyer, Chief of Staff United States Army, February 25, 1980, p. 5.

5. John O. Marsh, Jr. and General E. C. Meyer, "Meeting the Challenge of the 1980's," Joint Statement before Committees and Sub-Committees of the United States Senate and the House of Representatives, First Session, 97th Congress, (Washington: US Government Printing Office), p. 2.

6. "The Pentagon's Multibillion Shopping List," <u>US News and World Report</u>, June 23, 1980, p. 40.

7. David R. Griffiths, "Army Fund Plan Provides for Modest Modernization," <u>Aviation Week & Space Technology</u>, January 19, 1981, p. 22.

8. Ibid., p. 23.

9. John D. Marsh, Jr. and General E. C. Meyer, "The Posture of the Army and Department of the Army Budget Estimates for Fiscal Year 1982," Joint Statement before Committees and Sub-Committees of the United States Senate and the House of Representatives, Second Session, 97th Congress, (Washington: US Government Printing Office), p. 7.

10. James, Op. Cit., p. 20.

11. Ibid., p. 21.

CHAPTER II

TECHNIQUES FOR MANAGING MODERNIZATION AT UNIT LEVEL

Network Analysis

The field commanders of the Army must develop functional and systematic procedures that take into account peculiarities of their organization for the final and most crucial phase of the equipment modernization program. Such a system must be compatible with the Army Modernization Information Memorandum (AMIM), Materiel Fielding Plan (MFP), Memorandums of Understanding (MOU), Statement of Quality and Support (SOQAS), etc.

The AMIM is produced by the Department of Army (Force Modernization Office), and is designed to close the information gap for the commanders.[1] It is aligned with the Planning, Program Budget System (PPBS) and contains a description of all new equipment that is scheduled to be fielded for the next five years. This document is vital for the initial planning for training and logistical support systems that complement the new equipment.[2]

The purpose of the MFP is to furnish predeployment planning information on each new piece of equipment and is designed to achieve orderly deployment and logistical support in much more detail than is provided in the AMIM. This document is prepared by the major command headquarters; e.g., Forces Command (FORSCOM), in coordination with Training

and Doctrine Command (TRADOC), the Development and Readiness Command (DARCOM) and Force Modernization Office (FMA).[3]

The MOU and SOQAS are prepared by DARCOM for the purpose of achieving user satisfaction. These documents contain responsibility for the conversion and management of the initial logistical support; e.g., spare parts, special tools, test equipment, etc.[4]

Initial planning at the division level can begin upon receipt of the AMIM and/or any of the other documents as noted above to include additional guidance from the major commands; e.g., distribution plans. Regardless of the analytic technique used, the first order of business should be to identify the different items of equipment that are programmed for the unit. It may also be feasible to appoint project officers/units during this period. A document should be prepared that contains all available information for planning purposes. As a minimum, contents of this document should consist of goals, objectives, responsibilities, equipment distribution (template), basic time schedules and coordinators for higher headquarters. The next step should be to develop a system that will produce systematic planning, detailed coordination, continuous evaluation, and a simplistic approach for monitoring and modifying the existing plans. Many analytic management techniques can be utilized to accomplish the above; from the use of computers, flow charting, Gantt charts, milestone charting to the Program Evaluation and Review Technique (PERT).[5]

Upon analyzing the above techniques, and when comparing the advantages versus the disadvantages, it is concluded that the PERT approach with supporting techniques will provide the commanders and staff alike the most comprehensive planning system for implementing the modernization program at the unit level.

Evolution and Advantages of Network Analysis

The Program Evaluation and Review Technique (PERT) was developed in 1957 by the Navy as an analytical method for managing the Polaris weapon system program. Initially it was only concerned with time variables; however, cost variables were soon added as a management tool. It was immediately coupled with sophisticated computer programs to handle the quantity of calculations that became necessary for large, complex programs. With the use of the computer, PERT priced itself out of business as a planning technique for smaller projects as it was not cost effective, computer time in many cases was not available, and due to the rigidity of the system, it was viewed as counterproductive.[6] However, PERT can be used as a manual system for small projects such as implementing the modernization plan for an Army Division. An individual that is knowledgeable in PERT, in conjunction with a calculator, can manually process two hundred activities in less than a day.[7] The spin-off of the manual system when properly orchestrated is the knowledge gained by the commanders and staffs on the project, the coordination that is effected throughout the command, and above all, it serves as an excellent technique for the commander to cause the staff to produce detailed and coordinated staff work. The four major results achieved with this multifaceted approach on the management level are: (1) goal planning and sequencing, (2) time planning, (3) scheduling, and (4) control.[8] Without question this technique is initially time-consuming; however, in the long run a much greater degree of efficiency can be achieved as a result of detailed planning, assignment of obtainable objectives, and the identification of potential problem areas that can be resolved on a timely basis.

Basic Concepts for Network Analysis

The basic concepts for PERT are defined in many basic management books. A comprehensive reference that deals exclusively with the subject is a self-paced text as identified at Endnote 7 of this chapter. This text can prepare an individual for PERT programming in the minimum time and is encouraged as a reference book for all project officers. For this paper, only the basic concepts will be discussed to add to my ideas for using PERT in developing the unit equipment modernization plan. First of all, the basic network is made up of symbols called activities. Circles are traditionally used; however, it will be advantageous to use different symbols to identify the various actors that are concerned with the program; e.g., squares, triangles, half circles, etc. More will be discussed on this subject in Chapter III. The key is that each symbol represents an event that must have a beginning and an end. The symbols are connected by an arrow that represents an activity to accomplish the event. (See Figure 1, page 17). The network must follow a pattern with the logic of the work flow. A subsequent event cannot start until the previous event has been completed if it is directly dependent on that event. An exception to this rule is the use of a broken arrow called a "dummy activity" or "constraint" which indicates that completion of the event that the broken arrow is extended from must occur prior to the completion of the event that it is extended to. (See Figure 2, page 17 which depicts that event 2 must be completed prior to event 4 being completed.) However, parallel events can be on-going if they are not directly related to other parallel events. It must also be pointed out that numbers can be used for events and letters for activities. (See Figure 2, page 17 for numbered parallel events.) If numbers are used, an event output must be constructed to identify the events and

should be attached to the PERT chart.[9]

Time estimates are normally acquired for each activity and consist of three time estimates—optimistic, most likely, and pessimistic. The reason for acquiring these three time factors is to gauge the uncertainty involved in the plan. By using the following formula, the expected time (t_e) can be computed: Expected time (t_e) $= \dfrac{a + 4m + b}{6}$

a — is the optimistic time estimate;
b — is the most likely time estimate;
$t_e^{\,c}$ — is the pessimistic time estimate;
t_e — is the average time that the activity would take if it were repeated many times.[10]

Since it is possible to be confronted with events that contain either sufficient or insufficient information, one must be able to determine the variance of his time estimates to identify the uncertainty involved with the events. The statisticians have also produced a formula to do this for us. The symbol for variance is o^2 and the estimating equation is $o^2 = \dfrac{b - a}{6}^2$.[11]

A sample problem to compute the above times is as shown for two different estimates on the same event.

	Optimistic	Most Likely	Pessimistic
Jones	6	10	12
Brown	5	12	13

Jones $t_e = \dfrac{6 + (4 \times 10) + 12}{6} = \dfrac{6 + 40 + 12}{6} = 58 = 9.7$

$o^2 = \dfrac{12 - 6}{6}^2 = \dfrac{6}{6}^2 = 1^2 = 1$

Brown $t_e = \dfrac{5 + (4 \times 12) + 13}{6} = \dfrac{5 + 48 + 13}{6} = \dfrac{66}{6} = 11$

$o^2 = \dfrac{13 - 5}{6}^2 = \dfrac{8}{6}^2 = 1.3^2 = 1.7$

Thus Brown has greater variance than Jones. Jones's estimates should normally be used.

Other basic time concepts consist of the earliest expected time for each event T_E, the scheduled completion time (T_S), and the latest allowable time (T_L). The T_E estimate is obtained by accumulating the calculated time estimate (t_e) of each event along the longest path. The latest allowable time (T_L) is the time the event must be completed to prevent delay. This is achieved by tracing back from the final event along the path to the event in question by subtracting the (t_e) from the final time of each event as traced. The result of this computation is called the slack time (S). The path with the least amount of slack time is called the critical path and is so marked with a heavy line. It is along this path that maximum concentration must be made to ensure the project remains on schedule. (See Figure 3, page 17 for sample network computations.) In all cases, time may be shown as the basic time designators; e.g., hours, days, months, etc.[12] As a management tool and to provide a ready reference for the commander, an event output-slack sort chart can be constructed to provide a ready reference which depicts the time factors for a project. (See Table 1, page 18)[13] The process for network generation can begin once the basic techniques of PERT have been mastered and command guidance given identifying the equipment to be received and the responsible project officers/units.

Project Generation

This is the most crucial phase of the planning process using the PERT approach. As a basic rule the project goal or objective must be clearly stated. It should contain the final event and who the participants will be for the planning and execution phases. The life of the

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project must be clearly established. This information should be contained in the MFP and AMIM. It must be noted that in certain cases this could well be five years away, in which case very little planning will be required; however, such events should be noted on the overall master plan for continuity of future replacements in the staff sections (don't reinvent the wheel). Basic questions that must be considered by the command in relation to each project consist of receipt and distribution of AMIM, FORSCOM distribution plan of force modernization equipment, budget ammunition forecast, training requirements, and logistical support for new items of equipment. In order to professionally obtain this information, it is suggested that a work breakdown sheet similar to Table 2, page 19 be provided to each unit project officer to complete for their organization. The intent of this process is to identify all the tasks that each section is to accomplish. When completed, a workshop should be conducted to varify the validity of the information and to sort out any redundant or omitted events. This form also identifies any shortcomings in personnel that require special skill training or new Military Operational Speciality (MOS) training.

The next step requires the initial construction of the PERT network. The major subordinate units/sections that are identified as agencies effected in the project must be given guidance for the master PERT chart. (See Table 3, page 20 for sample multi-column PERT chart.) Note that this chart is not to scale and only reflects one year. However, the key is that all participating units must follow the same format in the construction of its separate PERT chart. At a later date the project officers, from here out referred to as the project management team, will combine all PERT charts into a master PERT diagram.

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Such an effort will then relate all events throughout the command with a time sequence. Using the sample chart at Table 3, page 20, note how each unit has been identified with different symbols for the construction of their PERT charts. Additional symbols can be used or color coded to identify subordinate units, etc. This technique in conjunction with the work breakdown sheet at Table 2, page 19, will allow each unit to construct its own PERT design that takes into account the peculiarities of the unit. This system will allow each subordinate command to identify essential events and activities and their local relationships. During the project management team's workshops, the interface between subsystems will generate a smoother transition for the drafting of the master PERT network as well as recognize significant interdependencies that can further reduce the overall effort of the command. As a result of this systems approach, communication throughout the command is enhanced which will improve qualitatively the end product.

Network Evaluation

Even with the best laid plans, unforeseen actions crop up causing a shift in the overall plans with expectations that the scheduled finish date will be met. This is another reason why PERT is so valuable and will save so much time if properly programmed and used. The project officer must consistently evaluate the program to insure that it is meeting the organization's goals. The evaluation process must analyze and reanalyze the program for all levels with the knowledge of where slippage or additional resources will be required in cases of unavoidable delays or changes. It may be that under the circumstances, the project cannot meet the specified time schedule. When this "bad" information is submitted to the boss, a sound professional reason why can

also accompany the bad news.

Network Monitoring

Closely akin to the evaluation process is monitoring. The difference between the two is basically techniques. Evaluation is continued throughout the process while monitoring by definition follows the completed plan. Through monitoring techniques a determination can be made as to progress and the expenditure rate of resources. By using the master PERT chart and superimposing a time scale and programmed budget/resource expenditure rate, the manager can track the progress. Simple techniques such as placing a string along the time line in conjunction with coloring-in completed events can readily depict the status of the project. Additional management tools can also be utilized such as Gantt and analysis charts. Monitoring in conjunction with continuous evaluation will reduce untimely delay and will provide sound information for required changes.

Network Modification

If the plan has been properly prepared and no large deviations have been superimposed on the system, major modifications should not be required. The key to making modifications is to eliminate all the formulas and calculations previously used. It must be realized that after the plan is complete you should have real time to work with; the former time formula was only used to determine the best possible time. Secondly, the master PERT chart should be used as a working document not a showpiece. Last, but above all, use the project management team for updating information or the system will revert into a non-productive aid.

In essence, PERT is only a management tool that is constructed by

humans. Initially it is time-consuming; however, in the long run it will save time and produce a more professional attitude in meeting the complex problems associated with the equipment modernization process for the United States Army while maintaining the combat readiness.

ENDNOTES

1. James B. Lincoln, "Fielding Army Systems: Experiences and Lessons Learned," Concepts, Vol. 3, No. 4, Autumn 1980, pp. 46-7.

2. Ibid., p. 47.

3. US Army Missile Command, Redstone Arsenal, Alabama, MCTNS Materiel Fielding Plan, FORSCOM edition with Change 1, June 1980.

4. Lincoln, op. cit., p. 53.

5. Michael J. White and others, Managing Public Systems: Analytic Techniques for Public Administration (North Scituate: Duxbury Press, 1980), p. 88.

6. Ibid., pp 88-9.

7. David M. Dresdner, John A. Spiech, and Gerald M. Uslan, A Programmed Introduction to PERT (New York: John Wiley & Sons, Inc., 1963), p. 117.

8. Fred Luthans, Introduction to Management (New York: McGraw-Hill Book Company, 1976), p. 373.

9. White, op. cit., pp. 89-90.

10. Dresdner, op. cit., p. 56.

11. Dresdner, op. cit., p. 65.

12. White, op. cit., pp. 89-95.

13. Dresdner, op. cit., p. 119.
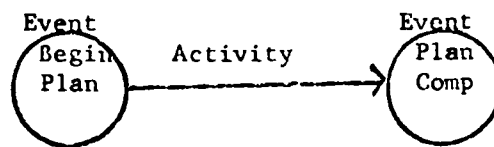
Figure 1
Basic Network
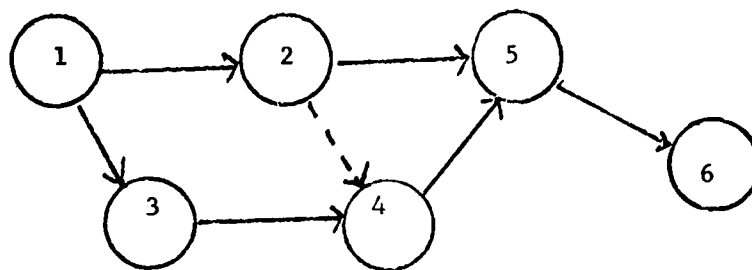
Figure 2
Numbered Parallel Events

t_e = calculated activity
   time
T_E = earliest expected time
T_L = latest time allowable
S = slack
T_e = expected time
T_s = scheduled time
→ = critical path
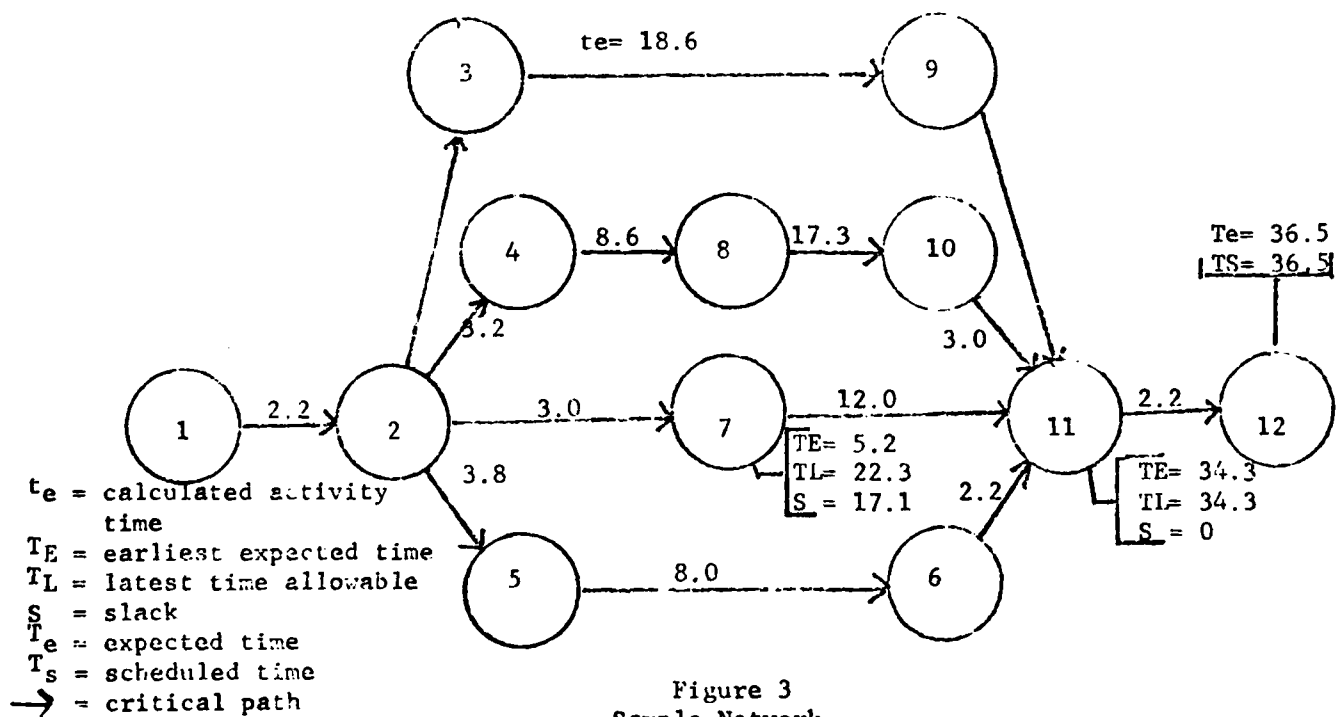
Figure 3
Sample Network

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TABLE 1

SAMPLE EVENT OUTPUT-SLACK SORT CHART

EVENT NOMEN-CLATURE	EVENT NO.	ACTUAL DATE	T_E	T_L	T_S	SLACK	σ^2	P_R
Start of Project	0		6 Dec 81	30 Jan 82		-2.0	0.0	
	3		4 Jan 82	5 Mar 82		-4.0	3.2	

Source:

  Dresdner, David M., John A. Spiech, Gerald M. Uslan. A Programmed Introduction to PERT. New York: John Wiley & Sons, Inc., 1963. P. 119.

TABLE 2

WORK BREAKDOWN SHEET

WORK BREAKDOWN SHEET
(Read Instructions on Other Side)

PROJECT	UNIT	CHART NO	PREPARED BY
	SEC	PAGE	TELE NR
		OF PAGES	DATE

REFERENCES

REMARKS

LINE NO	(1)	(2)	(3)	(4)	(5)	(6)	(7)

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INSTRUCTIONS FOR PREPARATION OF WORK BREAKDOWN SHEET

HEADING

Project - Designate major project - e.g. Stinger - (MCTNS)

Unit -

Sec -

Chart No - Numerical sequence of assigned projects. (List smae number regardless of number of pages for each separate project.)

Page __ **of** __ **pages** - Numerical sequence for total number of pages (If there are 3 pages would read 1 of 3, 2 of 3 and 3 of 3)

Prepared By - Name of person completing. (Allows for timely coordination.)

Tele Nr - Office telephone number of person completing form.

Date - Date form completed.

Reference - Manuals and directives related to project/ equipment. (FM, TM, Fielding Plan, etc.)

Remarks - Any comments to clarify data. (Use back of form or attached sheets.)

(1) Task.

(2) Name indiv responsible for conducting task.

(3) Job title of (2) above.

(4) Actual MOS of indiv completing task.

(5) Required MOS as specified to.

(6) Estimated time that will be required to complete task.

(7) Remarks.

TABLE 3

MULTI-COLUMN PERT CHART

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
COMPT												
DMMC												
DIV STAFF												
MAINT BN												
UNITS												
G3 SCHOOLS												

CHAPTER III

SAMPLE MODEL EXERCISE

This chapter will deal with the partial development of a PERT network for the F1M92A Stinger portable anti-aircraft missile in an airborne division. In no way is this intended to even come close to identifying all the tasks or events that must be considered for this system nor may it include all the units that must plan for its implementation. The intent is to depict the techniques and some of the aids that may be used and to further amplify what has previously been written.

Develop Network Plan

The initial phase must begin with command guidance which is normally provided in letter form from the division headquarters. In this situation, the division selected a decentralized approach for the assignment of force modernization equipment responsiblity. Each major subordinate unit, separate battalions, and selected staff sections had been assigned selected projects that were compatible to their particular units or level of responsibility. With this matter resolved, the project officer should schedule a workshop to coordinate the mechanics of how the plan will be implemented; e.g., what forms will be used, milestones, and define the responsibility of each subordinate project officer.

Work Breakdown Structure

The first step is to define who is involved with the project. By using the multi-column PERT chart at Table 4, page 24, this information can quickly be determined and recorded for all participants. In this case, the work breakdown structure will consist of the comptroller, Division Materiel Management Center (DMMC), Maintenance Battalion (MB), Supply and Service Battalion (S&S), Air Defense Battalion (ADA), and the Division project officer and staff. Symbols are assigned for the PERT network to include the time scale so that events may be aligned for coordination at subsequent project management team meetings. The work breakdown sheet is also provided for each unit to prepare based on the time schedule provided by the Division project officer. A sample of this form is shown at Table 5, page 25. Each task on this form provides the basis for events for the PERT chart and also identifies any person- nel shortfall and coordination factors. The t_e for line 2 has been computed as 20 days. To arrive at this factor, it was determined that a qualified individual such as CPT Jones could accomplish this in the average time of ten days. If major additional tasks were required, which can occur, or another less qualified individual had to perform the task, thirty days would be required. A combination of the above would take twenty days, thus the formula would be:

$$t_e = \frac{a + 4m + b}{6} = \frac{10 + (4 \times 20) + 30}{6} = \frac{120}{6} = 20 \text{ days}$$

To take this further, the standard deviation variance would be:

$$(o)^2 = \frac{b - a}{6}^2 = \frac{30 - 10}{6}^2 = \frac{20}{6}^2 = (3.3)^2 = 11$$

By computing this early in the process, the individuals with the most

experience can provide the most realistic data thus providing the minimum amount of information for construction of the PERT network.

Review management team meetings should be conducted as necessary to coordinate the actions and resolve any problem areas noted. Once the tasks have been agreed upon, coordinated and approved, each subsection can begin work on the PERT chart. The key to remember is that the PERT chart should be a working, functional chart not a showpiece.

Develop Mini-Network

As each unit develops its PERT network based on defined time scales, the concepts as discussed in Chapter II should be followed. Without any doubt, alot of work will go into this plan; however, much work will be saved in the long run, not to mention the expert knowledge that will be gained plus the management tool for monitoring the project will be developed. Several workshop reviews should be conducted prior to integrating the subsystems into the master PERT chart. If the charts are drawn to the same scale, all that will be required is to stack them by unit, connect parallel events as required and monitor the progress of the project.

For a sample diagram see Figure 4, page 26. It should also be noted that only numbered events are used. A table indicating what the numbers represent must also be constructed.

TABLE 4

MULTI-COLUMN PERT CHART

		360 OCT	330 NOV	300 DEC	270 JAN	240 FEB	210 MAR	180 APR	150 MAY	120 JUN	90 JUL	60 AUG	30 SEP
COMP-TROLLER	⌓												
DMMC	△												
DIV PROJECT OFFICER	◯												
MAINT BN	▽												
S&S BN	⌐												
ADA BN	▢												

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TABLE 5

WORK BREAKDOWN SHEET

WORK BREAKDOWN SHEET
(Read Instructions on Other Side)

PROJECT Stinger	UNIT DISCOM SEC DMMC	CHART NO 1 PAGE 1 OF 10 PAGES	PREPARED BY CPT C. P. Doe TELE NR 236-4014 DATE 12 NOV 81

REFERENCES MPP # ___
TC ___

LINE NO	(1)	(2)	(3)	(4)	(5)	(6)	(7) REMARKS
1	Acquire Slack Deck	SFC Brown		76X	76X	N/A	Rec 13 Oct 81
2	Determine ASL/ PLL Req.	CPT Jones		1A		20 days	Min req for this system
3	Request Class IX Equip & Spec Tools	CPT Smith				90 days	Coord w/ Maint Bn

INSTRUCTIONS FOR PREPARATION OF WORK BREAKDOWN SHEET

HEADING

Project - Designate major project - e.g. Stinger - (MCTNS)

Unit - .

Sec - .

Chart No - Numerical sequence of assigned projects. (List same number regardless of number of pages for each separate project.)

Page _ of _ pages - Numerical sequence for total number of pages (If there are 3 pages would read 1 of 3, 2 of 3 and 3 of 3)

Prepared By - Name of person completing. (Allows for timely coordination.)
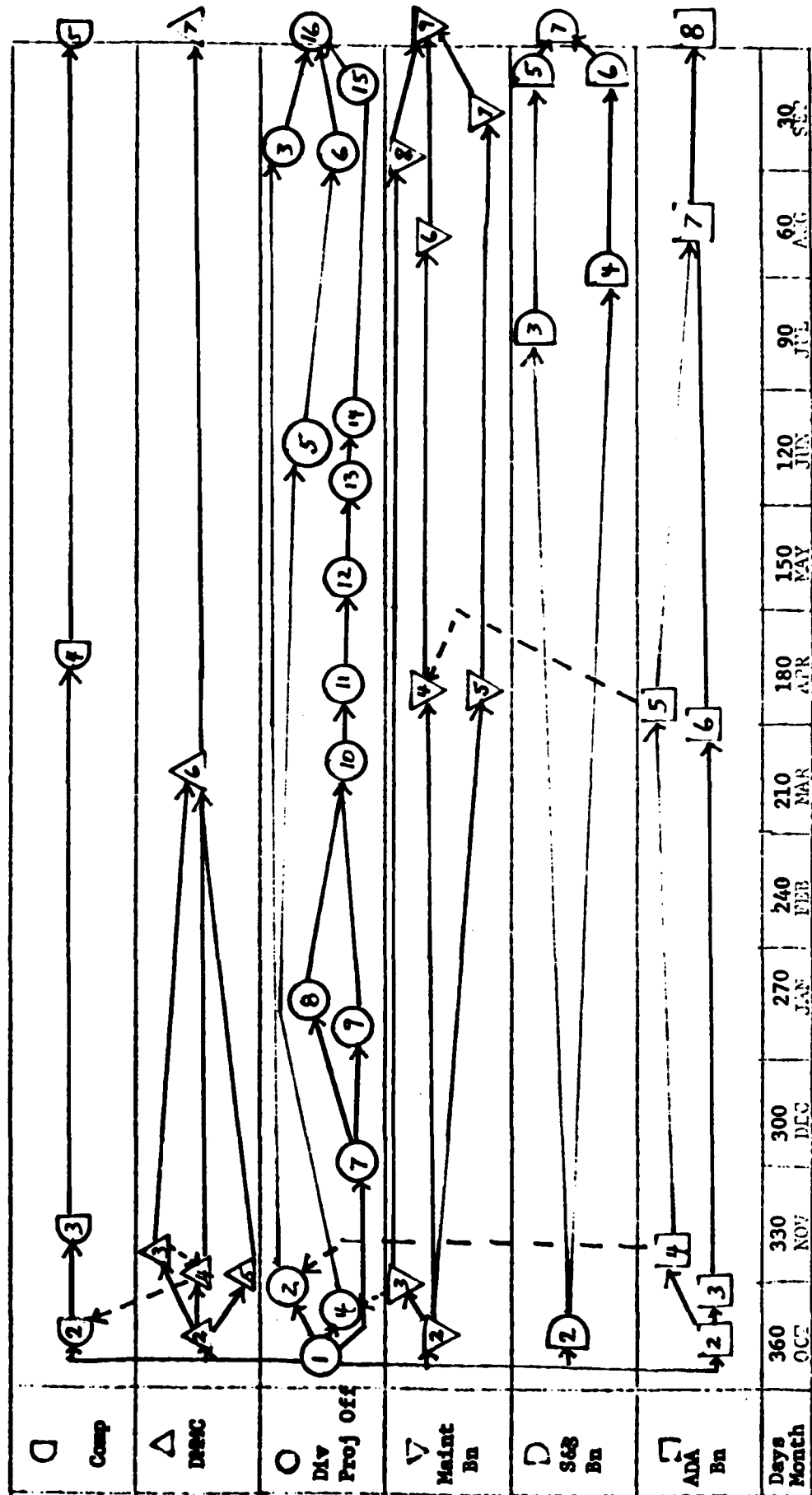
Tele Nr - Office telephone number of person completing form.

Date - Date form completed.

Reference - Manuals and directives related to project/ equipment. (FM, TM, Fielding Plan, etc.)

Remarks - Any comments to clarify data. (Use back of form or attached sheets.)

(1) Task.

(2) Name indiv responsible for conducting task.

(3) Job title of (2) above.

(4) Actual MOS of indiv completing task.

(5) Required MOS as specified to.

(6) Estimated time that will be required to complete task.

(7) Remarks.

Figure 4

MULTI-COLUMN PERT CHART

Left column

EVENT	NO.	EVENT	T_E	T_L
⌂	2	Receive final MFP	360	360
	3	Confirm funding available	330	330
	4	Identify fund req	180	180
	5	Project complete		0
△	2	Receive final MFP	360	360
	3	Acquire slack deck	330	330
	4	Determine ASP/PLL costs	330	325
	5	Determine ordering inst.	350	325
	6	Requisition IX equipment special tools, etc.	325	325
	7	Project complete		180
◯	1	Receive final MFP and provide to units		360
	2	Req tng aids, ranges and tng areas	350	320
	3	Tng aids arrive, ranges comp. & tng areas approved		30
	4	Update school requirement	350	100
	5	First tng soldier begins to arrive in unit	100	5
	6	Last tng soldier arrives in unit	5	0
	7	Determine contingency ammo	300	
	8	Est Army/AF agreement on loading	280	270
	9	Req contingency ammo	270	260
	10	Command briefing conducted	250	210
	11	Staff proposed distribution of equip	200	180
	12	Announce distribution plan	170	150
	13	Forecast monthly ammo req	100	90
	14	Identify shipment dates	60	30
	15	Receive ammo	20	5

Right column

EVENT	NO.	EVENT	T_E	T_L
▽	2	Receive final MFP	360	360
	3	Accomplish support maint tng	200	30
	4	Plan MWO prep	200	180
	5	Ck of calibration equip and procedures	200	180
	6	Complete MWO prep and system verification	150	60
	7	Receive new equipment and support equipment	30	5
	8	Last tng soldier arrives	5	0
	9	Project completed		
⊃	2	Receive final MFP		360
	3	Rec, store, and safeguard Class IX, ammo & sp tools	90	5
	4	Rec and storage completed	5	0
	5	Start rig contingency ammo	60	5
	6	Complete rig ammo	5	0
	7	Project completed		0
▢	2	Receive final MFP	360	350
	3	ID proj off	330	320
	4	Determine service school req		
	5	Determine swap out service ability criteria & procedures	300	180
	6	Verify all unit preparations	100	60
	7	Equipment received	5	0
	8	Projected completed		0

CHAPTER IV

CONCLUSION

With over fifty new major systems to be fielded in the 1980-85 time frame, the field commands need to develop policies, techniques, and procedures that will not only provide for timely fielding of these systems but also provide feedback to the development and research agencies to reduce any delays or substandard equipment based on the peculiarities of their units. The fielding plan is complex and requires the maximum effort. One system that offers an excellent management tool is the Programmed Evaluation Review Technique. It will not make decisions but will provide an excellent picture that will allow the units to systematically plan, coordinate, monitor, and refine the projects in the name of knowledge and information. We cannot rest on past experience, because never before has the Army received so many new systems in such a short period of time. In conjunction with this rapid modernization, there is a need for new thinking in the formulation of materiel fielding plans, especially at the unit level. PERT is not new; however, it can be used in a way that it has never been used before. What has been discussed in this paper is just a spark that can light a better way for more efficiently meeting the goals of the modernization of the Army.

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